

**JOINT BASE CHARLESTON-AIR
INSTALLATION RESTORATION PROGRAM
SOUTH CAROLINA**

STATEMENT OF BASIS FOR NO FURTHER ACTION

**AREAS OF CONCERN (AOC) AA (IRP SITE ZZ050) – Water Tower 2
and AOC BB (IRP SITE ZZ051) – Water Tower 3 Sites**

[March 2017]

Introduction

Joint Base Charleston-Air (JBCA) lies approximately 10 miles northwest of the city of Charleston and encompasses approximately 3,731 acres in area with an estimated population of 6,941 comprised of active duty military, Air Force reservists, and civilian personnel. The base population changes periodically as military operations vary from year to year and from mission to mission. The facility is under the jurisdiction of the United States Air Force's 628th Air Base Wing, Air Mobility Command. The facility is highly developed with most land used for military operations and housing. JBCA is surrounded by industrial, commercial, and residential properties that are part of the city of North Charleston, South Carolina.

This Statement of Basis (SoB) pertains to Air Force Areas of Concern (AOCs) AA (Installation Restoration Program [IRP] Site ZZ050, Water Tower 2) and AOC BB (IRP Site ZZ051, Water Tower 3) Sites which are expected to be added to the Base's Resource Conservation and Recovery Act (RCRA) Part B Permit during the next permit modification. The Permit will be issued by the South Carolina Department of Health and Environmental Control (DHEC), which has been delegated authority by the United

States Environmental Protection Agency (USEPA) for RCRA corrective actions.

A RCRA Facility Assessment (RFA) and RCRA Facility Investigation (RFI) were required by the DHEC to determine if lead concentrations in site soils exceeded the USEPA Regional Screening Level (RSL) for residential soils. The RFA and RFI requirement was based on the historic use of lead-based paint on the water towers structure, which were subject to weathering and pressure washing prior to painting.

This SoB explains the rationale for deciding that the decision for no further action (NFA) is appropriate for the AOC AA (Water Tower 2) and AOC BB (Water Tower 3) sites. This document is also intended to inform the general public of the intended NFA decision for the two sites. This document provides specific information on how the public can be involved in the NFA decision process. DHEC will not finalize the NFA decision until the public comment period has ended and all information submitted during the public comment period has been reviewed and considered.

This SoB should not be considered the primary source of information for these sites. The SoB summarizes information that

can be found in greater detail in the following documents:

- Final Technical Evaluation Report (TER) - As part of an Investigation of Oil Water Separators to determine Defense Environmental Restoration Account eligibility, three water tower sites were investigated in response to previous soil analytical data indicating elevated levels of lead in soil located beneath base's water towers, August 2012.
- Final AOC Z (ZZ049) – Water Tower 1, AOC AA (ZZ050) – Water Tower 2, and AOC BB (ZZ051) – Water Tower 3 Sites RCRA Facility Assessments and RCRA Facility Investigations Report, April 2015. The Water Towers 1, 2, and 3 Site soils were screened with an X-Ray Fluorescence (XRF) analyzer for lead along with DHEC certified and Department of Defense compliant fixed base laboratory analysis for lead. NFA was recommended for Water Tower 1 based on the results from this investigation. However, Water Towers 2 and 3 soil results indicated exceedances of the USEPA RSL of 400 milligrams per kilograms (mg/kg) for lead. The activities were conducted pursuant to a DHEC-approved work plan (Uniform Federal Policy Quality Assurance Project Plan [UFP-QAPP]). DHEC concurred with the NFA recommendation for Water Tower 1 and approved the AOC Z (IRP Site ZZ049) Water Tower 1 NFA SoB on 7 October 2015.
- AOC AA (ZZ050) – Water Tower 2 and AOC BB (ZZ051) – Water Tower 3

Sites Interim Measures Completion Report, December 2016. This report documents the lead soil removal, disposal, confirmatory soil sampling and restoration activities performed at the sites. Interim Measures field activities were conducted in accordance with the DHEC approved work plan (addendum to the UFP-QAPP)

The documents listed above are located at the information repositories JBCA Environmental Restoration Office and the DHEC office located in Columbia, South Carolina (addresses provided in the last section of this document). DHEC encourages the public to review these documents in order to gain a more thorough understanding of the sites and the completed activities that have been conducted.

Recommended Decision

The recommended decision for the Water Tower 2 and 3 sites is NFA. The NFA recommendation is based on the completion of the 2016 Interim Measures field activities, in which all lead contaminated soils above the USEPA Residential RSL were removed and confirmatory sampling indicated that remaining soils do not pose an unacceptable risk to current or potential future receptors and no additional removal actions are required. The DHEC Division of Waste Management, Bureau of Land and Waste Management, approved the Interim Measures Completion Report and concurred with the recommendation for NFA in a letter dated 6 February 2017 (DHEC 2017).

Site Background

Description

Historically, the water towers at JBCA were painted with lead-based exterior paint that was subjected to weathering and pre-painting activities including but not limited to sand blasting, pressure washing, and scraping.

The Water Tower 2 Site is located on North Davis Drive in the central part of JBCA, and the Water Tower 3 Site is located on the corner of South Davis Drive and James Avenue, southeast of Water Tower 2. Water Tower 2 also serves as a communications tower; various electronics and communication appurtenances are affixed to the top of the tower and in adjacent fenced in areas.

Investigations

Painting Project for Water Tower 3 (January 2011)

In January 2011, prior to conducting a painting project for Water Tower 3, the painting contractor collected 9 surface soil samples as a “Pre Job” assessment of lead contamination in the soil beneath and adjacent to the water tower and support features. Two (2) samples were collected directly beneath the tower on either side of the riser and one soil sample was collected at each of the 7 support legs (at a 5 foot [ft] step-out) for a total of 9 soil samples. Results from this sampling event ranged from 550 mg/kg to 2000 mg/kg. All nine samples were above the USEPA Residential RSL of 400 mg/kg (AECOM, 2012).

Lead-Based Paint Inspection and Soil Testing (June 2011)

In June 2011 the paint and site soils were analyzed for lead at Water Tower 2. The contractor used an XRF analyzer to measure and/or detect if lead was present in exterior surface coatings and also on interior structural components of the water tower. Thirty-four (34) readings were recorded and evaluated against the Housing and Urban Development guidelines which specify a positive determination of lead paint when the lead content is equal to or greater than 1.0 milligram per square centimeter (mg/cm^2) of a painted surface. Due to an inconclusive reading at one location above $1.0 \text{ mg}/\text{cm}^2$, a paint chip was collected for laboratory analysis along with another paint chip collected from an area indicating evidence of weathered paint chips. Both paint chip sample results indicated lead was not present in the paint chips sampled. Two composite soil samples were also collected, one from the perimeter boundary of the site, and the second from beneath the water tower. Both samples were below the USEPA Residential RSL of 400 mg/kg. The report concluded that no lead-based paint or lead hazards were identified during these inspection activities (Trident Environmental Services, 2011).

Technical Evaluation Report (August 2012)

In 2012, three JBCA water tower sites were investigated in response to previous soil analytical data indicating elevated levels of lead in soils located beneath Water Tower 3. All the water towers had a similar history of lead-based paint use, so the potential for lead contamination existed at the water tower sites. During this investigation one composite soil sample was collected at each

water tower site. Soil analytical results indicated lead concentrations of 26.3 mg/kg at the Water Tower 1 Site, 766 mg/kg at the Water Tower 2 Site and 743 mg/kg at the Water Tower 3 Site (AECOM, 2012).

RFA and RFI Report (April 2015)

In 2014, an XRF portable analyzer was utilized to conduct real-time soil screening and delineation of residual lead concentrations in native soils adjacent to and below the Water Towers 2 and 3. The XRF survey was conducted using a grid pattern centered around the location of the Water Towers 2 and 3 with survey locations approximately every 25 feet on the grid nodes (pending undisturbed soil from paving or buildings). XRF readings were used to guide laboratory soil sample locations to be collected if the XRF indicated lead contamination in soils were near or above the USEPA Residential RSL of 400 mg/kg (FPM, 2015).

Fourteen (14) surface soil samples were collected for laboratory analysis at Water Tower 2 for lead. Results from the surface soils laboratory analysis ranged from 200 mg/kg to 1170 mg/kg. At 6-inch intervals, vertical delineation was conducted at locations where surface concentrations were above 400 mg/kg. This led to the subsequent collection of seven subsurface soil samples collected for laboratory analysis. Lead was detected in all seven laboratory samples and at concentrations exceeding 400 mg/kg in six of the seven samples. Analytical results from the samples collected from 6 inches below ground surface (bgs) ranged from 362 mg/kg to 2010 mg/kg. Two samples were also collected for laboratory analysis from 12 inches bgs which indicated concentrations of

362 mg/kg and 505 mg/kg. All screened soils collected from 18 inches bgs were below 400 mg/kg and no laboratory samples were collected. Based on the analytical laboratory data, it was estimated that approximately 135 cubic yards (cy) of soil (from the surface to approximately 18 inches bgs) had been impacted, resulting in residual lead concentrations above the USEPA Residential RSL of 400 mg/kg and presenting an unacceptable risk to current and future potential receptors (FPM, 2015).

Initial XRF screening and soil sampling at the Water Tower 3 Site was conducted between April 28, 2014 and May 7, 2014 and additional Geoprobe® soil sample screening beneath the adjacent parking lot was completed on October 30, 2014. A total of 171 surface soil locations were screened using the XRF analyzer to aid in determining where off-site laboratory samples would be collected. XRF surface screening results aided in the collection of 15 surface soil samples for laboratory analysis for lead. Vertical screening was conducted via 6-inch intervals at the 15 locations where surface XRF results were at or above 400 mg/kg. XRF screening results ranged from 13 mg/kg to 3781 mg/kg from depths ranging from 6 to 12 inches bgs. Laboratory samples were again collected from locations where screening levels indicated that lead concentrations were at or above 400 mg/kg. Soil screening results from 12 to 18 inches bgs ranged from 43.8 mg/kg to 65.2 mg/kg, all below the USEPA Residential RSL for lead.

Analytical fixed based laboratory data from the Water Tower 3 site indicated that lead concentrations exceeded the USEPA Residential RSL in 14 of the 15 samples collected from the surface, with laboratory

results ranging from 375 mg/kg to 3630 mg/kg. Four subsurface soil samples were collected for laboratory analysis for lead from Water Tower 3 based on the XRF screening analysis. These samples were collected from the 6 inch bgs interval. Laboratory analysis results indicated that lead was detected in two of these samples at concentrations exceeding 400 mg/kg. Based on the analytical laboratory data, it was estimated that approximately 241 cy of soil (from the surface to approximately 12 inches bgs) had been impacted resulting in residual lead concentrations above the USEPA Residential RSL of 400 mg/kg and presenting an unacceptable risk to current and future potential receptors.

As part of the RFA and RFI, groundwater quality was evaluated at Water Towers 2 and 3 to evaluate if residual lead soil contamination has impacted the groundwater. One monitoring well was installed at each site within the area that soil results determined had the highest concentrations of lead. Analytical groundwater results indicated that the lead concentration in water was not a concern as the results were below the USEPA Tap water RSL for lead.

Water Tower 2 and 3 Interim Measure Removal Action (2016)

Based on the RFA and RFI results it was determined that soils delineated above the USEPA Residential RSL for lead would be excavated and disposed of offsite. FPM conducted interim measure activities from May through August 2016 which included;

- Real time XRF guided non-hazardous lead contaminated soil excavation, including trucking to and disposal of soils at Waste Management's Oakridge

Landfill in Dorchester, SC. Lead contaminated soil that was identified as hazardous for disposal was excavated from a small designated area of Water Tower 3, and disposed of at Waste Management's Hazardous Waste Disposal Facility in Emelle, Alabama.

- Confirmatory excavation end-point soil sampling for lead, and
- Site restoration activities included backfilling the excavated areas with certified clean soils to preexisting grade and reseeding the area with approved native grasses.

Water Tower 2

Excavation activities at the Water Tower 2 Site were conducted utilizing real-time XRF screening to guide the removal of identified contaminated soils. Upon completion of the contaminated soil removal, approximately 721.28 tons (approximately 601 cy) of contaminated soil from the Water Tower 2 Site was transported and disposed of as non-hazardous waste at Waste Management's Oakridge Landfill Facility in Dorchester, SC. The excavation boundaries extended beyond the previous RFA and RFI identified lateral extent and depth of 18 inches. FPM performed confirmatory end-point sampling of the Water Tower 2 exposed excavation "walls" and "floor." The end-point sampling schematic consisted of collecting discrete grab samples in accessible locations. This was conducted on a linear basis from the excavation "walls" at approximately 20 ft intervals, and from the excavation "floor", by an approximate 20 ft by 20 ft grid. A total of 45 "floor" and 33 "wall" end-point soil samples were collected and analyzed for lead at a DHEC certified and Department of Defense compliant fixed base laboratory.

The analysis of the post-excavation confirmatory end-point soil samples indicated that all residual lead detections throughout the Water Tower 2 Site were below the USEPA Residential RSL of 400 mg/kg. Based on the confirmatory end-point sample results indicating that residual lead concentrations in soils are below the USEPA Residential RSL of 400 mg/kg, the site was restored with approved clean backfill and reseeded using native grass seed (FPM, 2016). **Figure 1** presents the excavation boundary and confirmatory sample locations along with the laboratory results at the Water Tower 2 Site.

Water Tower 3

Initial excavation activities were conducted within the marked excavation boundary for soils containing lead concentrations requiring hazardous disposal based on RCRA characteristic sample results collected during the RFA and RFI (FPM, 2015). Approximately 29 tons (approximately 23 cy from the surface to approximately 10 inches bgs) of soil that were characterized as hazardous for disposal were excavated and placed in lined and covered roll-off containers for disposal at Waste Management's Emelle, Alabama Facility. The remaining soils that were determined to not be hazardous for disposal were then excavated using the XRF analyzer to continuously screen the newly exposed boundaries for lead contamination.

Excavation activities at Water Tower 3 were extended beyond the initial RFA and RFI identified contamination depth of 12 inches and the previously identified lateral boundaries. Approximately 726.86 tons (approximately 606 cy) of contaminated soil (non-hazardous disposal) from the Water

Tower 3 Site were transported to Waste Management's Oakridge Landfill Facility in Dorchester, SC for disposal.

FPM performed confirmatory end-point sampling of the Water Tower 3 exposed excavation "walls" and "floor." As previously stated, the end-point sampling schematic was consistent with the Water Tower 2 methodology. A total of 41 "floor" and 25 "wall" end-point soil samples were collected and analyzed at a DHEC certified and Department of Defense compliant fixed base laboratory for lead. (FPM, 2016).

The analysis of the laboratory post-excavation confirmatory end-point soil samples indicated that all but one sample location contained residual lead concentrations below the USEPA Residential RSL of 400 mg/kg at the Water Tower 3 Site. The area where this one sample was located was revisited and excavation was again conducted extending the previous boundaries to remove all soils that contained lead concentrations exceeding the USEPA Residential RSL. Upon completion of the additional excavation activities, another end-point confirmatory laboratory soil sample was collected and analyzed from the newly exposed excavation extent. Laboratory analysis of the additional excavation confirmation soil sample indicated that residual lead concentrations were below the USEPA Residential RSL of 400 mg/kg. Based on the confirmatory end-point sample results indicating that residual lead concentrations in soils are below the USEPA Residential RSL of 400 mg/kg, the site was restored with certified clean backfill and reseeded with native grasses (FPM, 2016). **Figure 2** presents the excavation boundary and confirmatory sample locations along with

the laboratory results at the Water Tower 3 Site.

Site Risk

Upon completion of the Interim Measures at the Water Towers 2 and 3 sites, all lead contaminated soils with concentrations above the USEPA Residential RSL have been removed. Confirmatory end-point soil sampling indicated that residual lead concentrations in soil were all below the USEPA Residential RSL of 400 mg/kg, indicating that no unacceptable human health risks from lead contaminated soil exists at the sites.

Remedy Implementation

No further remedy is warranted at the AOC AA (Water Tower 2) and AOC BB (Water Tower 3) Sites. Site investigations and removal activities have resulted in lead concentrations in soils that are below the USEPA Residential RSL.

Statutory Authorities

This document is being issued in compliance with the South Carolina Hazardous Waste Management Regulations (R.61-79) and federal hazardous waste management requirements. The JBCA Corrective Action Program is conducted under the authority of Sections 3004(u), 3004(v), 3005(c)(3), 3008(h), 3013, 6001, and 7703 of RCRA (42 U.S.C 6901 et seq.) as amended by the Hazardous and Solid Waste Amendment (HSWA) of 1984 (Pub. L. No. 98-616, 98 Stat. 3221) and the Federal Facility Compliance Act of 1992 (FFCA) (Pub. L. J02-386, J06 Stat. 1505).

This SoB is part of the corrective action process and is a requirement of the RCRA

Corrective Action Permit, referred to as the RCRA Permit, issued to JBCA by DHEC.

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FIGURES

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